Clinical Pathways

Post Operative Tethered Cord Patients

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What is a Clinical Pathway?

• An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective and consistent patient care.
Objectives of Pathway

• To improve and standardize post-operative care of the patient undergoing tethered cord surgery
• To eliminate variability and establish a standard of care for these patients
Why do we need this pathway?

- To change practice for post operative care of these select group of patients
- To guide care for these children
- To ensure standard of care is successfully implemented for the safety of the patient
What is Tethered Cord?

- Tethered cord occurs when the spinal cord is attached to tissues around the spine, most commonly at the base of the spine.
- The attached tissue limits the movement of the spinal cord within the spinal column and causes an abnormal stretching of the spinal cord and impairment of blood flow to the nerve tissue.
- Can be closely associated with spina bifida
- Can occur as an independent entity related to disorders of secondary neurulation and some tumors.

Image courtesy of: [https://www.seattlechildrens.org/conditions/brain-nervous-system-mental-conditions/tethered-spinal-cord/](https://www.seattlechildrens.org/conditions/brain-nervous-system-mental-conditions/tethered-spinal-cord/)
What is Tethered Cord?

• The lower tip of the spinal cord (conus medullaris) is normally located opposite the disc between the first and second lumbar vertebrae.

• With tethered cord, the conus medullaris may be located below the interspace between the second and third lumbar vertebrae, and/or there may be radiographic evidence of abnormal points of attachment (i.e. thickened filum terminale, intraspinal mass, spinal cord adjacent to thecal sack in a fixed position).
This is the Post Operative Tethered Cord Clinical Pathway.

We will be reviewing each component in the following slides.
Patients need to be flat in bed for 24 hours post procedure.

- Some patients will require PICU admission for sedation with precedex during this initial period of recovery.
- Most children can then transfer to the Med/Surg unit after 24 hours.

**Inclusion Criteria:** post-operative care for any patient diagnosed by Neurosurgery to have tethered cord syndrome requiring surgical correction

**Exclusion Criteria:** none

**Post-operative Care:**
- Admit to Neurosurgery (NSG) service
  - Transfer to Med/Surg if no sedation required, or
  - Transfer to PICU if requiring sedation for 24 hours to maintain flat in bed
    - Care per PICU for precedex infusion
    - Temperature, HR, RR, and BP q1hr x 24 hours, then q2hr
Standardized care for these patients includes five different categories.
All children will receive antibiotics for the first 24 hours post procedure.

- There is no indication for routine administration of antibiotics beyond 24 hours.

**Antibiotics**

Antibiotics to be given for only 24 hours post-operatively unless otherwise indicated.

**Cefazolin** 90-100 mg/kg/day div q8hr (max 2000 mg/dose)

OR

**Nafcilin** 200 mg/kg/day div q6hr (max 12 g/day); adult dose 2g q6hr

If β-Lactam allergy:

- **Vancomycin** 15 mg/kg/dose q6hr (≥18 yrs old: q8hr) max initial dose 1 g/day
NSAIDs, such as Toradol are an important part of post operative pain management.

- Children with known renal impairment should only get NSAIDs after discussion with Nephrology.

- **Toradol** 0.5 mg/kg/dose q6hr x 6 doses (max 30 mg/dose),
  - 6 hours after toradol dose, start **Ibuprofen** 10 mg/kg/dose q6hr PRN (max 40 mg/kg/day or 2,400 mg/day, whichever is less)

- **Acetaminophen** 12.5 mg/kg q4hr PRN pain (325-650 mg q4hr PRN for >12 yrs old) for mild/moderate pain
  OR

- **Hydrocodone/acetaminophen** 0.2 mL/kg hydrocodone q4hr PRN severe pain

- **Morphine** 0.05 – 0.1 mg IV q4hr PRN severe pain

*Acute Kidney Injury:

- 2 months-2 years: Cr >0.4 mg/dL
- 3 years-15 years: Cr >0.7 mg/dL
- >16 years: Cr >1.0 mg/dL

- Creatinine that:
  - Increases by 50% from baseline
  - Increases by 0.3 mg/dL
Nursing care includes both routine vital sign monitoring, incentive spirometry, and venous throbmo-embolism (VTE) prevention.

The surgical incision should be closely monitored.

**Neurosurgery should be notified of any fluid leakage from the incision**
As discussed, children will be on bedrest with the bed flat for the first 24 hours after surgery.

- Once patient is allowed to sit up, RN should evaluate for headaches. If a patient experiences a severe headache, they should return to having the head of bed (HOB) flat then gradually increase the HOB over several hours.

Early PT and OT consults are important to help reduce the risk of complications that may result from immobility.
Children will come out of the OR with a foley catheter in place. Once the foley catheter is removed, post void residuals (PVR) need to be checked and documented in the medical record.

- Patients with PVR greater than 10% of their estimated bladder capacity will need a urology consult.
- Urology is also consulted for patients with preexisting bladder dysfunction.

Other things to note related to Fluids, Nutrition, and Electrolytes:

- Bowel regimen is initiated immediately post op.
- There is no need for lab work in stable post operative patients.
Children will meet discharge criteria once they are:
- Afebrile for greater than 24 hours
- At their neurologic baseline
- Have good pain management on oral medications
- Tolerating their home diet

And
- Have had a bowel movement
Vital signs and Neuro checks for floor patients 4 hours for first 24 hours then every 8 hours if patient stable or not receiving regular narcotics

Vital signs and Neuro checks for PICU patients 1 hours for first 24 hours then every 2 hours if patient stable or not receiving regular narcotics

If patient requires Precedex then patient requires admission to PICU

No BLOOD WORK required for patient post operatively unless unstable.

Pain Control

Antibiotics x 24 hours

Notify NS attending for any bleeding, instability or wound drainage immediately.

PVR are essential once foley is out.

If PVR are significant (see algorithm in pathway) urology consult is indicated
The Post-Op Tethered Cord Order set should be used for all patients who are post procedure. It will help ensure that all pathway elements are ordered correctly.

Order sets also help track pathway usage and pathway metrics.

*NOTE: This order set is not to be used for PICU patients. Patients going to the PICU post operatively should use the PICU – Neurosurgery Order Set instead
Quality Metrics

- Percentage of patients with pathway order set usage
- Percentage of patients with deep wound infections
- Percentage of patients with superficial skin infections (SSI)
- Number of patients with organ space infection within 30 days of principal operative procedure
- Readmission within 30 days
- Return to the OR within 30 days
Pathway Contacts

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References


About Connecticut Children’s Clinical Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children’s, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment.

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